

CLIMATE IMPACTS

IN INDONESIA

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As one of the world's largest archipelago, **Indonesia is exceptionally vulnerable** to the adverse effects of a changing climate, which threatens its environment, economy, and society



CLIMATE IMPACTS: RISING SEA LEVELS

Facts: Every year, 1 hectare of land is lost along the coastal area of Demak, Central Java, due to rising sea levels. The first village to sink was Tambaksari, in 1997.

Impact on Coastal Areas: Indonesia, an archipelago with over 17,000 islands, is highly vulnerable to rising sea levels. Coastal erosion, increased flooding, and saltwater intrusion into freshwater systems threaten communities, agriculture, and infrastructure.

Displacement: Low-lying areas and small islands face the risk of displacement, affecting millions of people.



Jakarta is Sinking

Rising sea levels pose a severe and multifaceted threat to Jakarta, exacerbating the city's existing challenges with land subsidence because of the excessive groundwater extraction, rapid urbanization, and poor water management.

Sinking Rate: Approximately **10 centimeters per year**, Large parts of **North Jakarta could be underwater by 2050**.



How many villages and cities were sunk?

- 199 coastal districts/cities in Indonesia will be affected by annual tidal floods by 2050.
- Around 118,000 hectares of area will be submerged in sea water
- As many as 23 million people will be affected.
- Losses are estimated at IDR 1,576 trillion.



CLIMATE IMPACTS: UNPREDICTED RAINFALL PATTERNS

Indonesia's climate is heavily influenced by the monsoon, resulting in two primary seasons: the **wet season** (November to March) and the **dry season** (April to October). Historically, these cycles were relatively predictable, allowing for stable agricultural planning and water resource management.

Erratic Rainfall: In recent years, Indonesia has experienced more erratic and unseasonal rainfall, with heavy **downpours** occurring outside the traditional wet season and prolonged dry spells during the rainy season.

Shortened Seasons: The duration of the wet and dry seasons has become less consistent, complicating **agricultural** and **water management planning**.

THE IMPACTS OF UNPREDICTED RAINFALL PATTERNS

ON AGRICULTURE

ON WATER RESOURCES



Crop Failures



Pest and Disease Outbreaks



Water Scarcity



Flooding

CLIMATE IMPACTS ON BIODIVERSITY AND ECOSYSTEM

01

Extent of Forest Loss

Deforestation Rates: Indonesia lost approximately 9.75 million hectares of primary forest between 2002 and 2020, equivalent to a 15% decrease.

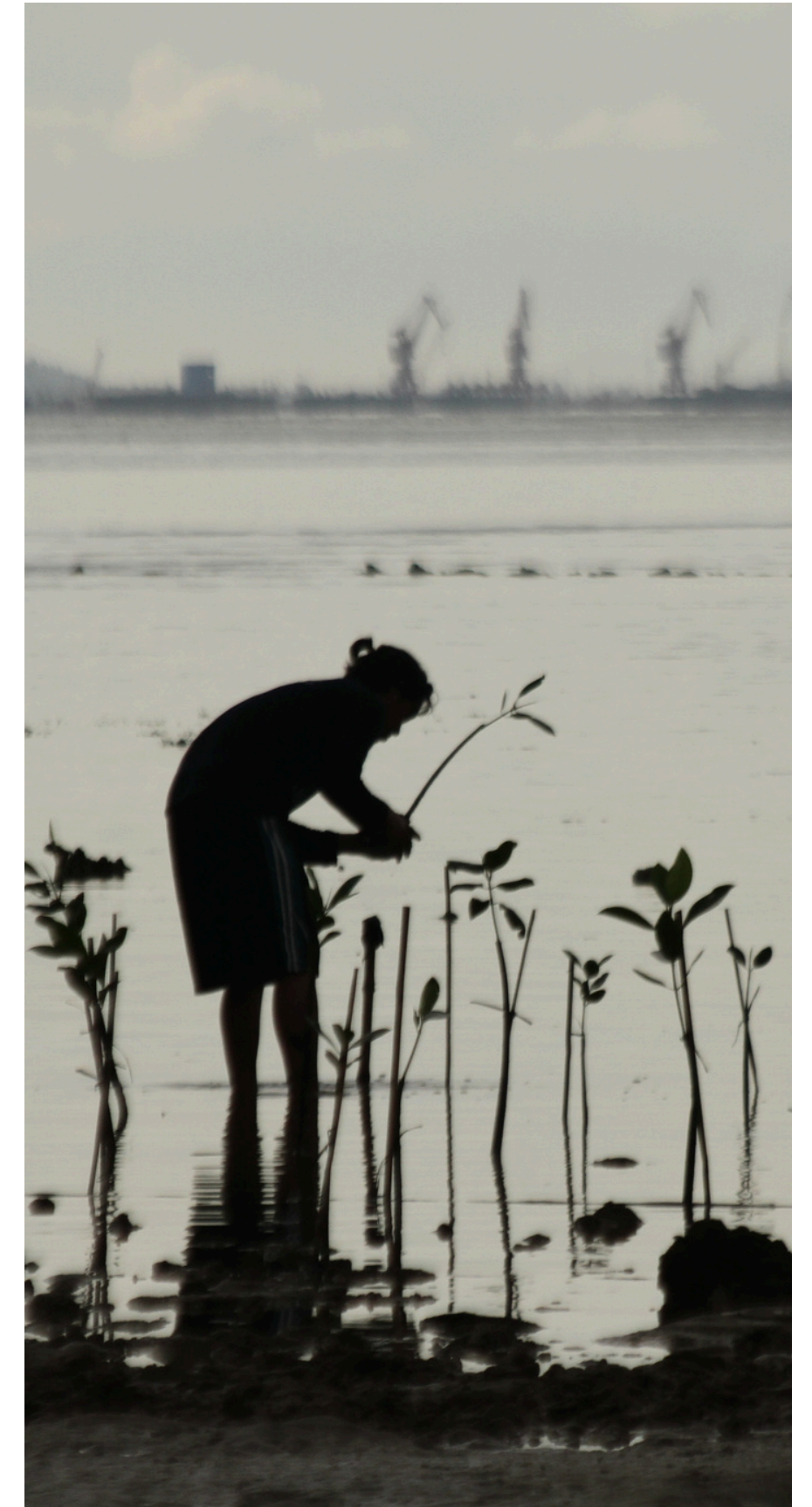
Annual Loss: The average annual loss of primary forest has been around 510,000 hectares, with significant peaks in certain years.

02

Extent of Mangrove Loss

Mangrove Coverage: Indonesia has one of the largest areas of mangroves in the world. However, it lost about 40% of its mangroves between 1980 and 2005, largely due to coastal development and aquaculture expansion. In 1980, the mangrove area was recorded at 4,200,000 ha. In 1990, the area decreased to 3,500,000 ha. Thus, there was a decrease in the area of mangrove forests by **70,000 ha in just one decade.**

According to a study published in *Nature Communications (2020)*, Indonesia lost around **600,000 hectares of mangroves from 2000 to 2016.**





03

Extent of Peatland Loss

- **Peatland Coverage:** Indonesia has extensive peatlands, primarily on the islands of Sumatra, Borneo, and Papua. These areas are crucial for carbon storage.
- **Degradation and Fires:** Large-scale drainage for agriculture and plantations, particularly for oil palm and pulpwood, has degraded peatlands. Fires, often used for land clearing, have further exacerbated the loss.

04

Extent of Coral Reef Degradation

- **Coral Coverage:** Coral reefs cover approximately 85,000 square kilometers in Indonesia. However, a significant portion is degraded.
- **Bleaching Events:** Major coral bleaching events have been recorded, particularly during strong El Niño years. For example, the 1997-1998 El Niño event caused widespread bleaching, affecting 50-90% of corals in some areas.
- Based on the document "Climate Change Vulnerability Profile of the Indonesian Coral Triangle Region" published by the Ministry of Environment and Forestry (KLHK) in 2021, of the total area of 50,875 km² of Indonesian coral reefs, 93% or around 39,538 km² area of coral reefs is threatened. Moreover, the status of coral reef ecosystems in Indonesia is 33.82% in the poor category.



SPECIES ENDANGEREMENT



The loss of forest habitat endangers many species, including critically endangered orangutans, tigers, and rhinoceroses. For instance, the Bornean orangutan population has **decreased by more than 50% over the past 60 years**, with habitat loss being a major factor.



Peatlands are habitats for unique and endangered species, such as the Sumatran tiger and orangutan. Their degradation leads to habitat loss and population declines.

Coral reefs are home to 25% of all marine species. Their degradation leads to a decline in fish populations and marine biodiversity, impacting ecosystems and local economies dependent on fishing and tourism.



CLIMATE IMPACT ON FISHERFOLK'S LIVES

In one year fishermen can only go to sea for 6 months. For the remaining 6 months, **they have to change their profession** to become a rough porter or hawker. Every year, (on average) **100 fishermen disappear/die at sea due to going to sea during bad weather.**

The number of fisherfolks in Indonesia continues to decrease

During 2010–2019, there has been a decline in the number of fishermen. In 2010 there were 2.16 million fisherfolks. However, in 2019, the number was only 1.83 million people. This means that in the last decade, around 330,000 fisherfolks in Indonesia have decreased.



SEA FOOD CRISIS

- Increasing temperatures will force fishes to move from tropical areas. Reducing the income of traditional fishermen and/or small-scale fishermen in Indonesia
- Coral-dependent fisheries Impacted
- Fishermen have to go further to get fishes
- Meanwhile, more than 30 percent of aquaculture in Southeast Asia will be unsuitable for such production by mid-century.
- In Southeast Asia, 99 percent of coral reefs will bleach and die due to the climate crisis by 2030



A photograph showing several children on inflatable rafts in a flooded area. The children are smiling and looking towards the camera. The background shows a flooded street with buildings and other people in the distance. The text is overlaid on the image in a large, bold, white font with a black outline.

EXTREME WEATHER EVENTS;

**FLOODS, LANDSLIDES,
DROUGHTS, & FOREST FIRES**

FLOODS

A person wearing a red helmet, a green t-shirt, and a grey safety vest is riding a black bicycle with red accents through floodwaters. The water is murky brown and reaches up to the person's chest. The bicycle has 'Dominate' written on the frame and 'UNITED' on the front fork. The person is looking forward with a focused expression.

2000-2010

- **2002 Jakarta Floods:** Over 300,000 people displaced.
- **2007 Jakarta Floods:** 2.6 million affected, 50 fatalities.
- **2008 West Sumatra Floods:** Heavy rains caused flooding and landslides, affecting over 100,000 people.

2011-2020

- **2013 Jakarta Floods:** Around 100,000 people displaced.
- **2015 South Sumatra Floods:** Extensive damage to homes and agriculture.
- **2016 Bandung Floods:** Affected over 90,000 people.
- **2019 Sulawesi Floods:** Widespread flooding and landslides affected over 500,000 people.

2021-2024

- **2021 South Kalimantan Floods:** Over 112,000 people affected, 63,000 displaced.
- **2023 Jakarta Floods:** Significant flooding affected over 100,000 people.
- **2023 West Java Floods:** Displaced around 50,000 people.
- **2024 Central Java Floods:** Over 200,000 people affected, significant agricultural damage.
- **2024 Sumatra Floods:** Displaced over 150,000 residents due to prolonged rainfall.

LANDSLIDES



2021-2024

- **2023 North Sulawesi Landslide:** Displaced over 1,000 people.
- **2024 West Java Landslide:** 45 deaths, 2,000 displaced.
- **2024 Central Sulawesi Landslide:** Affected over 1,500 people.

2000-2010

- **2004 Central Java Landslide:** 146 fatalities, thousands displaced.
- **2006 Southern Java Earthquake and Landslides:** Over 5,700 deaths, widespread displacement.

2011-2020

- **2016 Purworejo Landslide:** 47 deaths in Central Java.
- **2018 Sukabumi Landslide:** 31 deaths in West Java.
- **2020 North Sumatra Landslide:** Affected over 5,000 people.

DROUGHTS



2000-2010

- **2002-2003 Drought:** Severe drought affecting Java, Bali, and parts of Sumatra.
- **2006-2007 Drought:** Prolonged drought in Central Java, East Java, and Bali, causing significant agricultural impacts.

2021-2024

- **2023 Drought:** Moderate drought conditions in Central Java, East Java, Bali, and West Nusa Tenggara.
- **2024 Drought:** Severe drought affecting Java, Bali, Nusa Tenggara, and parts of Sumatra and Sulawesi, leading to significant water shortages and agricultural stress.

2011-2020

- **2012 Drought:** Severe drought conditions in Java, Nusa Tenggara, and parts of Sulawesi.
- **2015-2016 El Niño-Induced Drought:** One of the worst droughts in recent history, affecting Java, Sumatra, Kalimantan, and Papua.
- **2019 Drought:** Prolonged dry season impacting Java, Bali, Nusa Tenggara, and parts of Sulawesi.

FOREST FIRES

A person wearing a fire helmet is silhouetted against a night scene of a forest fire. The fire is bright and intense, with many sparks and embers flying through the air. The person's hand is raised to their forehead, possibly shielding their eyes from the bright light or smoke. The overall atmosphere is dramatic and urgent.

2000-2010

1. **2002-2003 Forest Fires:** Extensive fires in Sumatra and Kalimantan caused significant haze.
2. **2006 Forest Fires:** Severe fires during the dry season affected air quality across Southeast Asia.

2011-2020

1. **2013 Forest Fires:** Prolonged fires due to land clearing practices led to severe haze.
2. **2015 El Niño-Induced Fires:** Over 2.6 million hectares burned, causing severe haze and economic losses.
3. **2019 Forest Fires:** Over 1.6 million hectares burned, affecting millions and causing respiratory problems.

2021-2024

1. **2023 Forest Fires:** Moderate increase in fires, with significant impacts on air quality and health.
2. **2024 Forest Fires:** Prolonged dry conditions and increased land clearing led to widespread fires, affecting Sumatra, Kalimantan, Papua, and parts of Sulawesi.

CLIMATE IMPACTS ON ECONOMY IN INDONESIA



Flooding and Landslides:

- In 2020, Indonesia experienced severe flooding and landslides, particularly in Jakarta and surrounding areas. These events **caused over \$900 million in damages to infrastructure, including roads, bridges, and buildings.**

Coastal Erosion and Sea-Level Rise:

- Coastal erosion due to sea-level rise **threatens approximately 42 million people living in coastal areas.** Infrastructure such as seawalls and coastal defenses require significant investment to mitigate these risks.



Energy Sector:

- Indonesia's energy infrastructure is vulnerable to climate impacts. For instance, **hydropower plants face reduced water availability during droughts**, affecting energy production and causing economic losses.

Financial Impact:

Annual Costs: Indonesia incurs billions of dollars in losses annually from climate-related disasters. For instance, in recent years, total economic losses **from floods alone have averaged around \$500 million annually.**



Economic Losses on marine and fisheries:

The economic losses in the marine sector due to climate impacts are substantial. For instance, Indonesia's marine fisheries sector experienced losses exceeding **\$500 million annually due to declines in fish stocks and disruptions in marine ecosystems.**

Economic Costs on agriculture:

The economic costs of climate-related crop failures and reduced agricultural productivity are significant. In 2022, Indonesia experienced losses amounting to approximately \$1.8 billion due to droughts and floods affecting agriculture.





CLIMATE IMPACTS

ON CITIZEN'S

HEALTH

Direct Impacts

Extreme Heat:

Increased frequency and intensity of heatwaves causing heat-related illnesses such as heat exhaustion and heatstroke, particularly affecting vulnerable populations like the elderly and outdoor workers.

Air Quality:

Climate-related factors, including wildfires and increased particulate matter from drought-induced dust storms, degrade air quality. This can exacerbate respiratory diseases such as asthma and chronic obstructive pulmonary disease (COPD).

Vector-Borne Diseases:

Changes in temperature and precipitation patterns influence the distribution and transmission of vector-borne diseases like malaria, dengue fever, and Zika virus.





Indirect Health Impacts

Food Security:

Climate change affects agricultural productivity and food availability, leading to malnutrition and food insecurity among vulnerable populations. This can contribute to nutritional deficiencies and related health issues.

Mental Health:

Climate-related disasters and environmental degradation can cause stress, anxiety, and mental health disorders among affected communities, especially those facing repeated displacement and loss of livelihoods.

Waterborne Diseases:

Increased flooding and changes in precipitation patterns can contaminate water sources, leading to outbreaks of waterborne diseases such as cholera and typhoid fever.

PARI ISLAND'S CASE

“the first climate lawsuit in Indonesia’s history”

Resistance against the looming threat of climate crisis begins to rise on Pari Island, Kepulauan Seribu Regency, DKI Jakarta Province. Four residents of Pari island are calling for climate justice and holding Holcim accountable to the Court in Switzerland.





Switzerland Holcim Group is on the list of "Carbon Major" with sales reaching nearly 27 billion francs (2021). The company is the world's largest producer of building materials. Holcim currently operates 266 cement plants and grinding stations worldwide, and is a global market leader for the cement industry. Research mandated by HEKS/EPER shows that between 1950 and 2021, Holcim has produced more than 7 billion tons of cement and emitted more than 7 billion tons of CO₂. By 2021, the company produced 200 million tons of cement.

Unfortunately, the residents of Pari Island who reside far away must endure the consequences caused by the emission produced by wealthy nations in the North. Climate change has caused the increase of high sea levels, storms, high waves or tidal waves, and extreme weather that results in flooding. The higher the global temperature, the more frequent and extreme floods will occur. This threatens the existence of small islands and areas with low-lying coasts.



Case Updates:

- In mid-October 2023, the Zug Regional Court approved the request for legal assistance from Asmania, Arif Pujiyanto, Mustaghfirin (Bobby), and Edi Mulyono.
- Holcim had opposed providing legal aid but lost its argument. The court emphatically did not follow Holcim's argument that the lawsuit had no chance of success.
- Meanwhile, the lawsuit by four Indonesian people against the Swiss Cement Company continues. They are demanding compensation for the climate damage they have suffered, financial contributions to flood protection efforts, as well as an absolute reduction in Holcim's CO2 emissions.

“EKONOMI NUSANTARA”

Indonesian Tropical Spices, Coffee And Non-timber Forest Products

COMMUNITY-BASED MANAGEMENT AREA OF WALHI (FRIENDS OF THE EARTH INDONESIA)



ECONOMIC RECOVERY = ECOLOGICAL RECOVERY

THE BANTAENG COMMUNITY CONDUCTS AGROECOLOGICAL CULTIVATION, ONE OF ITS COMMODITIES IS COFFEE PLANTATIONS ON CRITICAL USED LAND





Satellite Image: 2003

Satellite Image: 2022

**COMMUNITY-BASED
MANAGEMENT
IMPLEMENTED IN
TANJUNG AUR,
BENGKULU**



#PULIHKANINDONESIA #RECOVERINDONESIA